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(71) Applicant (for all designated States except US): PHARMACIA & UPJOHN COMPANY [US/US]; 301 Henrietta Street, Kalamazoo, MI 49001 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): VOGELI, Gabriel [US/US]; 3005 First Avenue, Seattle, WA 98121 (US). WOOD, Linda, S. [US/US]; 10193 Fox Hollow, Portage, MI 49024 (US). PARODI, Luis, A. [SE/SE]; Grevgafan-24, S-115 43 Stockholm (SE). HIEBSCH, Ronald, R. [US/US]; 917 Lane Boulevard, Kalamazoo,

MI 49001 (US). LIND, Peter [SE/SE]; Borjegatan 31C, S-751 29 Uppsala (SE). SLIGHTOM, Jerry [US/US]; 3305 Lorraine Avenue, Kalamazoo, MI 49008 (US). SCHELLIN, Kathleen, A. [US/US]; 361 Jason Court, Portage, MI 49024 (US). KAYTES, Paul, S. [US/US]; 3506-D Shadow Bend Drive, Kalamazoo, MI 49004 (US). BANNIGAN, Christopher, M. [US/US]; 2411 Kopka Court, Bay City, MI 48708 (US). RUFF, Valerie [US/US]; 7301 Sandpiper Street, Portage, MI 49024 (US). SEJLITZ, Torsten [SE/SE]; Sankt Eriksgatan 59, S-112 34 Stockholm (SE). HUFF, Rita, M. [US/US]; 3627 B Avenue, West, Plainwell, MI 49080 (US).

(74) Agents: DELUCA, Mark et al.; Woodcock Washburn Kurtz Mackiewicz & Norris LLP, One Liberty Place, 46th Floor, Philadelphia, PA 19103 (US).

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(54) Title: HUMAN G PROTEIN-COUPLED RECEPTORS

(57) Abstract: The present invention provides a gene encoding a G protein-coupled receptor termed nGPCR-x; constructs and recombinant host cells incorporating the genes; the nGPCR-x polypeptides encoded by the gene; antibodies to the nGPCR-x polypeptides; and methods of making and using all of the foregoing.



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## INTERNATIONAL SEARCH REPORT

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/12 C12N15/11 C07K14/705 C07K16/28 C12Q1/68  
G01N33/68

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EMBL, EPO-Internal, WPI Data, BIOSIS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>US 5 686 573 A (CIVELLI OLIVIER ET AL) 11 November 1997 (1997-11-11)</p> <p>Note: 57.2% nt seq identity of SEQ ID NO:1 with SEQ ID NO:1 in 306 nt overlap (381-675:1021-724) column 3, line 41 -column 7, line 22 figures 2-5 claim 1</p> <p style="text-align: center;">--- -/-</p>	<p>1,3,4,8, 10,18, 27, 31-33, 36,43, 44,47, 48,53, 54,56, 57,62, 63,91</p>



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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\*A\* document defining the general state of the art which is not considered to be of particular relevance

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\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

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Date of the actual completion of the international search

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+31-70) 340-3016

Authorized officer

van de Kamp, M

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International Application No

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## C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EM_HUM 'Online!  EMBL;  ID HS20I3, AC AL035423,  12 February 1999 (1999-02-12)  PEARCE A: "Human DNA sequence from clone  2013 on chromosome Xq25-26. Contains a  gene for brain mitochondrial carrier  protein-1 (BMCP1), ESTs, STSs, GSSs and a  CpG island"  XP002172504  Note: 100.0% nt seq identity with SEQ ID  NO:1 in 1182 nt overlap  (80867-82048:1-1182)  page 29</p>	1-8
A	<p>WO 93 25677 A (GARVAN INST MED RES ;PIERCE  KERRIE DIANE (AU); SELBIE LISA (AU); F)  23 December 1993 (1993-12-23)  Note: 26.5% aa seq identity of A1  adenosine receptor with SEQ ID NO:2 in 306  aa overlap (6-302:3-293)  page 2, line 15 -page 4, line 10  claims 1,4,7  figures 1,4,5</p>	40
P,X	<p>WO 00 22131 A (ARENA PHARMACEUTICALS INC  ;GORE MARTIN (US); LIAW CHEN W (US); LIN)  20 April 2000 (2000-04-20)  Note: 100.0% nt seq identity of SEQ ID  NO:7 with SEQ ID NO:1 in 1008 nt overlap  (1-1008:1146-139), 100.0% aa seq identity  of SEQ ID NO:8 with SEQ ID NO:2 in 335 aa  overlap (1-335:1-335)  tables B,C,E  claims 37-40</p>	1-66,69, 78,91-95
P,X	<p>WO 00 31258 A (ARENA PHARMACEUTICALS INC  ;LIAW CHEN W (US); LIN I LIN (US); CHEN)  2 June 2000 (2000-06-02)  Note: 100.0% nt seq identity of SEQ ID  NO:7 with SEQ ID NO:1 in 1008 nt overlap  (1-1008:1146-139), 100.0% aa seq identity  of SEQ ID NO:8 with SEQ ID NO:2 in 335 aa  overlap (1-335:1-335)  page 17, line 4  page 24, line 17 -page 25, line 3  table A  claims 13-16</p>	1-66,69, 78,91-95
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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>WO 00 50562 A (SYNAPTIC PHARMA CORP)  31 August 2000 (2000-08-31)  Note: 99.9% nt seq identity of SEQ ID NO:1  with SEQ ID NO:1 in 1106 nt overlap  (25-1129:1182-77), 100.0% aa seq identity  of SEQ ID NO:2 with SEQ ID NO:2 in 335 aa  overlap (1-335:1-335)  page 5, line 3 -page 17, line 15  claims 1-156  figures 1,2,5-10</p>	<p>1-66,69,  78,91-95</p>
E	<p>EP 1 092 727 A (PFIZER LTD ;PFIZER (US))  18 April 2001 (2001-04-18)  Note: 100.0% nt seq identity of SEQ ID  NO:1 with SEQ ID NO:1 in 1008 nt overlap  (1-1008:1146-139), 99.7% aa seq identity  of SEQ ID NO:2 with SEQ ID NO:2 in 335 aa  overlap (1-334:1-335)  page 2, line 31-56  claims 1-56  page 31</p>	<p>1-66,69,  78,91-95</p>
E	<p>WO 01 42288 A (INCYTE GENOMICS INC ;REDDY  ROOPA (US); AU YOUNG JANICE (US); BAUGH)  14 June 2001 (2001-06-14)  Note: 100.0% nt seq identity of SEQ ID  NO:67 with SEQ ID NO:1 in 1008 nt overlap  (1-1008:1146-139), 100.0% aa seq identity  of SEQ ID NO:28 with SEQ ID NO:2 in 335 aa  overlap (1-335:1-335)  page 5, line 34 -page 10, line 27  tables 1-4  claims 1-28</p>	<p>1-66,69,  78,91-95</p>
X	<p>WO 99 37679 A (ROBISON KEITH ;GLUCKSMANN M  ALEXANDRA (US); MILLENNIUM PHARM INC ( )  29 July 1999 (1999-07-29)</p> <p>Note: 66.9% nt seq identity of SEQ ID NO:1  with SEQ ID NO:185 in 981 nt overlap  (156-1128:32-1005), 52.3% aa seq identity  of SEQ ID NO:2 with SEQ ID NO:186 in 329  aa overlap (1-323:1-327)  page 2, line 28 -page 3, line 9  claims 1-26  figures 1-3</p>	<p>1,3,4,8,  10,18,  27,  31-33,  36,38,  40,43,  44,47,  48,53,  54,56,  57,62,  63,91</p>

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EM_HTG 'Online! EMBL; ID AC007104, AC AC007104, 23 March 1999 (1999-03-23) STONE N E ET AL.: "Homo sapiens chromosome 4, *** SEQUENCING IN PROGRESS ***, 16 unordered pieces" XP002185203 Note: 100.0% nt seq identity with SEQ ID NO:185 in 728 nt overlap (195066-195793:728-1) page 48</p>	1-4,8
P,X	<p>WO 00 64942 A (SMITHKLINE BEECHAM PLC ;SMITHKLINE BEECHAM CORP (US)) 2 November 2000 (2000-11-02) Note: 100.0% nt seq identity of SEQ ID NO:1 with SEQ ID NO:185 in 1092 nt overlap (61-1152:1-1092), 100.0% aa seq identity of SEQ ID NO:2 with SEQ ID NO:186 in 363 aa overlap (1-363:1-363) page 3, line 9 -page 4, line 6 claims 1-9</p>	1-66,69, 78,91-95
E	<p>WO 01 36471 A (ARENA PHARMACEUTICALS INC ;CHEN RUOPING (US); DANG HUONG T (US); L) 25 May 2001 (2001-05-25) Note: 99.8% nt seq identity of SEQ ID NO:31 with SEQ ID NO:185 in 1092 nt overlap, 99.7% aa seq identity of SEQ ID NO:32 with SEQ ID NO:186 in 363 aa overlap page 35, line 15 -page 36, line 6 tables B,C,E-G,J claims 61-64</p>	1-66,69, 78,91-95
X	<p>GLICKMAN M ET AL.: "Molecular cloning, tissue-specific expression, and chromosomal localization of a nerve growth factor-regulated G-protein-coupled receptor, nrg-1" MOLECULAR AND CELLULAR NEUROSCIENCES, vol. 14, August 1999 (1999-08), pages 141-152, XP002934509 ISSN: 1044-7431</p> <p>Note: 80.1% nt seq identity of nrg-1 with SEQ ID NO:77 in 1046 nt overlap (258-1303:1-1040), 85.8% aa seq identity of NRG-1 with SEQ ID NO:78 in 401 aa overlap (1-400:1-398) abstract figure 1</p>	1,3,4,8, 10,18, 27, 31-33, 36,38, 40,43, 44,47, 48,53, 54,56, 57,62, 63,91

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WO 99 19513 A (LXR BIOTECHNOLOGY INC ; ERIKSON JAMES (US); KIEFER MICHAEL (US); 60) 22 April 1999 (1999-04-22)</p> <p>Note: 59.5% identity of SEQ ID NO:4 with SEQ ID NO:77 in 650 nt overlap (67-707:37-680), 48.7% aa seq identity of translated SEQ ID NO:4 with SEQ ID NO:78 in 374 aa overlap (13-383:23-376) page 8, line 10 -page 9, line 33 claims 1-4</p>	<p>1,3,4,8, 10,18, 27, 31-33, 36,38, 40,43, 44,47, 48,53, 54,56, 57,62, 63,91</p>
X	<p>DATABASE EM_HUM 'Online! EMBL; ID AC011461, AC AC011461, 8 October 1999 (1999-10-08) DOE JOINT GENOME INSTITUTE: "Homo sapiens chromosome 19 clone CTC-429L19, complete sequence" XP002185204 Note: 100.0% nt seq identity with SEQ ID NO:77 in 1197 nt overlap (41760-42956:1-1197) page 11-12</p>	<p>1-8</p>
P,X	<p>WO 00 11166 A (MILLENNIUM PHARM INC) 2 March 2000 (2000-03-02) Note: 99.8% nt seq identity of SEQ ID NO:2 with SEQ ID NO:77 in 1197 nt overlap (152-1348:1-1197), 99.8% aa seq identity of SEQ ID NO:1 with SEQ ID NO:78 in 398 aa overlap (1-398:1-398) page 9, line 5 -page 10, line 24 claims 1-23 figure 1</p>	<p>1-66,69, 78,91-95</p>
E	<p>WO 01 04139 A (MICHALOVICH DAVID ; SMITHKLINE BEECHAM PLC (GB); ELSHOURBAGY NABIL) 18 January 2001 (2001-01-18) Note: 100.0% nt seq identity of SEQ ID NO:1 with SEQ ID NO:77 in 1197 nt overlap (1-1197:1-1197), 100.0% aa seq identity of SEQ ID NO:2 with SEQ ID NO:78 in 398 aa overlap (1-398:1-398) page 3, line 18 -page 4, line 19 claims 1-16 figures 1,2</p>	<p>1-66,69, 78,91-95</p>

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C/(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>NOMURA H ET AL.: "Molecular cloning of cDNAs encoding a LD78 receptor and putative leukocyte chemotactic peptide receptors"</p> <p>INTERNATIONAL IMMUNOLOGY, vol. 5, no. 10, October 1993 (1993-10), pages 1239-1249, XP002911511 ISSN: 0953-8178</p> <p>Note: 65.2% nt seq identity of HM74 with SEQ ID NO:79 in 750 nt overlap (97-839:1-746), 52.2% aa seq identity of translated HM74 with SEQ ID NO:80 in 341 aa overlap the whole document</p>	<p>1,3,4,8, 10,18, 27, 31-33, 36,38, 40,43, 44,47, 48,53, 54,56, 57,62, 63,91</p>
P,X	<p>--- DATABASE EM_NEW 'Online! EMBL; ID AC026333, AC AC026333, 23 March 2000 (2000-03-23) MUZNY D M ET AL.: "Homo sapiens chromosome 12 clone RP11-324E6, WORKING DRAFT SEQUENCE, 13 unordered pieces" XP002185205 Note: 100.0% nt seq identity with SEQ ID NO:79 in 1041 nt overlap (15571-16611:1-1041) page 6</p>	<p>1-8</p>
E	<p>--- WO 01 77320 A (BAYER AG ;XIAO YONGHONG (US)) 18 October 2001 (2001-10-18) Note: 100.0% nt seq identity of SEQ ID NO:1 with SEQ ID NO:79 in 1041 nt overlap (464-1504:1-1041) page 3, line 22 -page 6, line 20 figures 1,2 claims 1-17</p>	<p>1-66,69, 78,91-95</p>
X	<p>--- DATABASE EM_GSS 'Online! EMBL; ID AQ888495, AC AQ888495, 11 November 1999 (1999-11-11) MAHAIRAS G G ET AL.: "HS_3162_B1_B01_MR CIT Approved Human Genomic Sperm Library D Homo sapiens genomic clone Plate=3162 Col=1 Row=D, genomic survey sequence" XP002185206 Note: 96.8% nt seq identity with SEQ ID NO:81 in 406 nt overlap (1-398:405-809) the whole document</p> <p>--- -/--</p>	<p>1-4,8</p>

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 99 29849 A (INCYTE PHARMA INC ;YUE HENRY (US); BANDMAN OLGA (US); LAL PREETI ()) 17 June 1999 (1999-06-17)</p> <p>Note: 24.4% aa seq identity of SEQ ID NO:3 with SEQ ID NO:82 in 316 aa overlap (23-331:2-303)</p> <p>page 3, line 14 -page 5, line 20</p> <p>claims 1-21</p> <p>figures 3,4</p>	40
P,X	<p>-----</p> <p>DATABASE EM_HUM 'Online!'</p> <p>EMBL;</p> <p>ID AC083865, AC AC083865,</p> <p>9 October 2000 (2000-10-09)</p> <p>KAUL R K ET AL.: "Homo sapiens chromosome 7 clone RP11-605P22, complete sequence"</p> <p>XP002185207</p> <p>Note: 100.0% nt seq identity with SEQ ID NO:81 in 2517 nt overlap (133106-135622:10-2525)</p> <p>page 36</p>	1-4,8
X	<p>-----</p> <p>WO 96 39440 A (HUMAN GENOME SCIENCES INC ;LI YI (US); RUBEN STEVEN M (US)) 12 December 1996 (1996-12-12)</p> <p>Note: 56.9% nt seq identity of SEQ ID NO:1 with SEQ ID NO:83 in 722 nt overlap (239-949:73-779), 43.8% aa seq identity of SEQ ID NO:2 with SEQ ID NO:84 in 331 aa overlap (16-337:13-343)</p> <p>page 4, line 22 -page 6, line 20</p> <p>claims 1-20</p> <p>figure 1</p> <p>-----</p> <p style="text-align: center;">-/--</p>	1,3,4,8, 10,18, 27, 31-33, 36,38, 40,43, 44,47, 48,53, 54,56, 57,62, 63,91



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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	<p>US 6 117 990 A (BONINI JAMES A ET AL) 12 September 2000 (2000-09-12)</p> <p>Note: 71.3% nt seq identity of SEQ ID NO:1 with SEQ ID NO:83 in 1089 nt overlap (39-1126:37-1124), 69.0% aa seq identity of SEQ ID NO:2 with SEQ ID NO:84 in 345 aa overlap (1-345:1-345) figures 1,2 column 1, line 37-60 claims 1-4</p>	<p>1-4,8, 10,18, 27, 31-33, 36,38, 40,43, 44,47, 48,53, 54,56, 57,62, 63,91</p>
T	<p>--- DATABASE EM_HUM 'Online! EMBL; ID AF380192, AC AF380192, 6 July 2001 (2001-07-06) BOROWSKY B ET AL.: "Homo sapiens trace amine receptor 4 (TA4) gene, complete cds" XP002185208 Note: 100.0% nt seq identity with SEQ ID NO:83 in 1038 nt overlap (1-1038:88-1125), 100.0% aa seq identity with SEQ ID NO:84 in 345 aa overlap (1-345:1-345) the whole document</p>	
T	<p>-&amp; BOROWSKY B ET AL.: "Trace amines: Identification of a family of mammalian G protein-coupled receptors" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, vol. 98, no. 16, 31 July 2001 (2001-07-31), pages 8966-8971, XP002185201 abstract figure 4</p> <p>--- -/--</p>	

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WO 97 19170 A (EUROSCREEN S A ;COMMUNI DIDIER (BE); PIROTON SABINE (BE); PARMENT) 29 May 1997 (1997-05-29)</p> <p>Note: 55.3% nt seq identity of SEQ ID NO:1 with SEQ ID NO:85 in 450 nt overlap (278-726:95-540), 32.9% aa seq identity of SEQ ID NO:2 with SEQ ID NO:86 in 295 aa overlap (26-315:23-312) page 2, line 22 -page 12, line 3 claims 1-77 figures 1-11</p>	<p>1,3,4,8, 10,18, 27, 31-33, 36,38, 40,43, 44,47, 48,53, 54,56, 57,62, 63,91</p>
P,X	<p>--- DATABASE EM_NEW 'Online! EMBL; ID AL356486, AC AL356486, 21 May 2000 (2000-05-21) SKUCE C: "Human DNA sequence from clone RP11-721F14 on chromosome 13" XP002185209 Note: 99.5% nt seq identity with SEQ ID NO:85 in 1020 nt overlap (4078-5094:1020-1) page 3</p>	<p>1-8</p>
E	<p>--- WO 01 49847 A (WHITE DAVID ;GLUCKSMANN MARIA ALEXANDRA (US); MILLENNIUM PHARM INC) 12 July 2001 (2001-07-12) Note: 99.4% nt seq identity of SEQ ID NO:2 with SEQ ID NO:85 in 1020 nt overlap (291-1307:1-1020), 92.0% aa seq identity of SEQ ID NO:1 with SEQ ID NO:86 in 339 aa overlap (1-335:1-336) page 6, line 18 -page 9, line 16 claims 1-26 figure 1</p> <p>--- -/--</p>	<p>1-66, 68-95</p>

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>EP 0 859 055 A (SMITHKLINE BEECHAM CORP) 19 August 1998 (1998-08-19)</p> <p>Note: 61.0% nt seq identity of SEQ ID NO:1 with SEQ ID NO:87 in 743 nt overlap (944-1669:222-953), 50.8% aa seq identity of SEQ ID NO:2 with SEQ ID NO:90 in 299 aa overlap (46-341:38-336) page 3, line 13-24 claims 1-25 figure 1</p>	<p>1,3,4,8, 10,18, 27, 31-33, 36,38, 40,43, 44,47, 48,53, 54,56, 57,62, 63,91</p>
E	<p>WO 01 72841 A (PE CORP NY) 4 October 2001 (2001-10-04) Note: 100.0% nt seq identity of SEQ ID NO:3 with SEQ ID NO:87 in 1138 nt overlap (860-1997:1-1138), 100.0% aa seq identity of transl SEQ ID NO:3 with SEQ ID NO:90 in 339 aa overlap page 7, line 12 -page 9, line 11 claims 1-23 figures 1-3</p>	<p>1-66,69, 78,91-95</p>
E	<p>WO 00 73449 A (OGOZALEK KRISTINE L ;BOROWSKY BETH E (US); JONES KENNETH A (US); S) 7 December 2000 (2000-12-07) Note: 100.0% nt seq identity of SEQ ID NO:5 with SEQ ID NO:87 in 869 nt overlap (1-869:269-1137), 100.0% aa seq identity of SEQ ID NO:6 with SEQ ID NO:90 in 339 aa overlap (1-339:1-339) page 12, line 3 -page 27, line 15 claims 1-168 figures 5,6</p>	<p>1-66,69, 78,91-95</p>
T	<p>DATABASE EM_HUM 'Online! EMBL; ID AF380185, AC AF380185, 6 July 2001 (2001-07-06) BOROWSKY B ET AL.: "Homo sapiens trace amine receptor 1 (TA1) gene, complete cds" XP002185210 Note: 100.0% nt seq identity with SEQ ID NO:87 in 863 nt overlap (1-863:275-1137), 100.0% aa seq identity with SEQ ID NO:90 in 339 aa overlap (1-339:1-339) the whole document</p>	

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/31581

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>EP 0 859 052 A (SMITHKLINE BEECHAM CORP) 19 August 1998 (1998-08-19)</p> <p>Note: 54.5% nt seq identity of SEQ ID NO:1 with SEQ ID NO:91 in 1113 nt overlap (863-1919:315-1382) page 3, line 13-23 claims 1-25 figure 1</p>	<p>1,3,4,8, 10,18, 27, 31-33, 36,43, 44,47, 48,53, 54,56, 57,62, 63,91</p>
A	<p>XU W-F ET AL.: "Cloning and characterization of human protease-activated receptor 4." PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, vol. 95, no. 12, 9 June 1998 (1998-06-09), pages 6642-6646, XP002185202 June 9, 1998 ISSN: 0027-8424 Note: 31.0% aa seq identity of PAR4 with SEQ ID NO:92 in 367 aa overlap (39-376:21-373) abstract figures 1,3,4</p>	40
X	<p>DATABASE EM_HTG 'Online! EMBL; ID AC005849, AC AC005849, 23 October 1998 (1998-10-23) SMITH D R: "Homo sapiens chromosome 11 clone CIT-HSP-1337H24, *** SEQUENCING IN PROGRESS ***, 9 unordered pieces" XP002185211 Note: 99.9% nt seq identity with SEQ ID NO:91 in 1697 nt overlap (111522-113218:1696-1) page 28-29</p>	1-8
P,X	<p>WO 00 26339 A (SMITHKLINE BEECHAM CORP) 11 May 2000 (2000-05-11) Note: 100.0% nt seq identity of SEQ ID NO:3 with SEQ ID NO:91 in 1413 nt overlap (1-1413:212-1624), 100.0% aa seq identity of SEQ ID NO:4 with SEQ ID NO:92 in 470 aa overlap (1-470:36-505) page 3, line 15-29 claims 1-14</p>	<p>1-66,69, 78,91-95</p>

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# INTERNATIONAL SEARCH REPORT

International Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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E	WO 01 68839 A (BAYER AG ; RAMAKRISHNAN SHYAM (US)) 20 September 2001 (2001-09-20) Note: 99.9% nt seq identity of SEQ ID NO:1 with SEQ ID NO:91 in 1697 nt overlap (383-2079:1-1696) page 5, line 3 -page 7, line 6 claims 1-16 figures 1,2	1-66, 69, 78, 91-95
X	WILSON S ET AL.: "Orphan G-protein-coupled receptors: the next generation of drug targets" BRITISH JOURNAL OF PHARMACOLOGY, vol. 125, no. 7, December 1998 (1998-12), pages 1387-1392, XP001010584 the whole document	53, 56, 62
X	COWARD P ET AL: "Chimeric G proteins allow a high-throughput signalling assay of Gi-coupled receptors" ANALYTICAL BIOCHEMISTRY, vol. 270, no. 2, 1 June 1999 (1999-06-01), pages 242-248, XP000984715 ISSN: 0003-2697 abstract	53, 56, 62
X	WO 97 40148 A (BOUVIER MICHEL ; LOISEL THOMAS P (CA); UNIV MONTREAL L (CA); HEBERT) 30 October 1997 (1997-10-30) page 5, line 10 -page 6, line 13	53, 56, 62
A	JI T H ET AL.: "G protein-coupled receptors. I. Diversity of receptor-ligand interactions" JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 273, no. 28, 10 July 1998 (1998-07-10), pages 17299-17302, XP002173248 the whole document	53, 56, 62
A	WO 99 28470 A (GOODEARL ANDREW D J ; XIE MICHAEL (US); DISTEFANO PETER (US); GLUCK) 10 June 1999 (1999-06-10) page 5, line 1 -page 13, line 36 examples 1,2 claims 1-20	

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 00/31581

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
  
Although and/or insofar as claims 47, 72-76, 78 and 79 are directed to a method of treatment of the human/animal body or to a diagnostic method practised on the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:  
  
1-95 (inventions 1,2,5,6,11,27,30,32,34)
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims: it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-66, 69, 78, 91-95 (all partially)

An isolated nucleic acid molecule comprising a nucleotide sequence that encodes a polypeptide comprising an amino acid sequence homologous to SEQ ID NOs 1 or 73 and fragments thereof; said nucleic acid molecule encoding at least a portion of nGPCR-1. Corresponding vectors, transformed host cells, complementary nucleic acids, compositions, polypeptides (SEQ ID NOs 2 or 74), antibodies, and methods of use.

2. Claims: 1-66, 69, 78, 91-95 (all partially)

As invention 1, but concerning SEQ ID NOs 3 and 185, nGPCR-3, and SEQ ID NOs 4 and 186.

3. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65, 91-93 (all partially)

As invention 1, but concerning SEQ ID NO:5, nGPCR-4, and SEQ ID NO:6.

4. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65, 91-93 (all partially); 96, 97 (both completely)

As invention 1, but concerning SEQ ID NOs 7 and 75, nGPCR-5, and SEQ ID NOs 8 and 76.

5. Claims: 1-66, 69, 78, 91-95 (all partially)

As invention 1, but concerning SEQ ID NOs 9 and 77, nGPCR-9, and SEQ ID NOs 10 and 78.

6. Claims: 1-66, 69, 78, 91-95 (all partially)

As invention 1, but concerning SEQ ID NOs 11 and 79, nGPCR-11, and SEQ ID NOs 12 and 80.

7. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65, 91-93 (all partially)

As invention 1, but concerning SEQ ID NO:13, nGPCR-12, and SEQ ID NO:14.

**FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210**

8. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:15, nGPCR-14, and  
SEQ ID NO:16.

9. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:17, nGPCR-15, and  
SEQ ID NO:18.

10. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:19, nGPCR-18, and  
SEQ ID NO:20.

11. Claims: 1-66, 69, 78, 91-95 (all partially)

As invention 1, but concerning SEQ ID NOs 21 and 81,  
nGPCR-16, and SEQ ID NOs 22 and 82.

12. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:23, nGPCR-17, and  
SEQ ID NO:24.

13. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:25, nGPCR-20, and  
SEQ ID NO:26.

14. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:27, nGPCR-21, and  
SEQ ID NO:28.



FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

15. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:29, nGPCR-22, and  
SEQ ID NO:30.

16. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:31, nGPCR-24, and  
SEQ ID NO:32.

17. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:33, nGPCR-27, and  
SEQ ID NO:34.

18. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:35, nGPCR-28, and  
SEQ ID NO:36.

19. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:37, nGPCR-31, and  
SEQ ID NO:38.

20. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:39, nGPCR-32, and  
SEQ ID NO:40.

21. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:41, nGPCR-33, and  
SEQ ID NO:42.

FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

22. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:43, nGPCR-34, and  
SEQ ID NO:44.

23. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:45, nGPCR-35, and  
SEQ ID NO:46.

24. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:47, nGPCR-36, and  
SEQ ID NO:48.

25. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:49, nGPCR-37, and  
SEQ ID NO:50.

26. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:51, nGPCR-38, and  
SEQ ID NO:52.

27. Claims: 1-66, 69-95 (all partially); 67 (completely)

As invention 1, but concerning SEQ ID NOs 53 and 83,  
nGPCR-40, and SEQ ID NOs 54 and 84.

28. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:55, nGPCR-41, and  
SEQ ID NO:56.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

29. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:57, nGPCR-53, and  
SEQ ID NO:58.

30. Claims: 1-66, 69-95 (all partially); 68 (completely)

As invention 1, but concerning SEQ ID NOs 59 and 85,  
nGPCR-54, and SEQ ID NOs 60 and 86.

31. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:61, nGPCR-55, and  
SEQ ID NO:62.

32. Claims: 1-66, 69, 78, 91-95 (all partially)

As invention 1, but concerning SEQ ID NOs 63, 87 and 89,  
nGPCR-56, and SEQ ID NOs 64, 88 and 90.

33. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:65, nGPCR-57, and  
SEQ ID NO:66.

34. Claims: 1-66, 69, 78, 91-95 (all partially)

As invention 1, but concerning SEQ ID NOs 67, 91 and 93,  
nGPCR-58, and SEQ ID NOs 68, 92 and 94.

35. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

As invention 1, but concerning SEQ ID NO:69, nGPCR-59, and  
SEQ ID NO:70.

36. Claims: 1-5, 8-11, 14-29, 31-40, 43-48, 51-57, 60-65,  
91-93 (all partially)

**FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210**

As invention 1, but concerning SEQ ID NO:71, nGPCR-60, and  
SEQ ID NO:72.

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Information on patent family members

Int. Application No

PCT/US 00/31581

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